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TRADE AND DEVELOPMENT BOARD
Commission on Investment, Technology and Related Financial Issues
Expert Meeting on International Arrangements for Transfer of Technology:
Best Practices for Access to and Measures to Encourage Transfer of Technology
with a view to Capacity Building in Developing Countries,
especially in Least Developed Countries
Geneva, 27 June 2001
Item 2 of the provisional agenda

PROVISIONAL AGENDA AND ANNOTATIONS

I. Provisional agenda

1 Election of officers

2 Adoption of the agenda

3 International arrangements for transfer of technology

4 Adoption of the outcome of the Meeting

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II. Annotations to the provisional agenda

Item 1 - Election of officers

1 It is recommended that the Expert Meeting elect a Chairperson and a Vice-Chairperson-cum-Rapporteur.

Item 2 - Adoption of the agenda

2 The provisional agenda for the Meeting is in section I above. A detailed programme will be available one week before the Meeting.

Documentation

TD/B/COM.2/EM.9/1 Provisional agenda and annotations

Item 3 - International arrangements for transfer of technology: Best practices for access to and measures to encourage transfer of technology with a view to capacity building in developing countries, especially in least developed countries

3 The Trade and Development Board decided to convene an expert meeting on International Arrangements for Transfer of Technology: Best Practices for Access to and Measures to Encourage Transfer of Technology within the framework of the Commission on Investment, Technology and Related Financial Issues. The Expert Meeting provides a forum for experts to exchange national experiences and identify best practices with respect to existing agreements on transfer technology.

4 The concerns of the international community with respect to enhancing the transfer of technology to developing countries, as well as their technological capabilities, are enshrined in several dozen international instruments. The technology-related provisions contained in such instruments follow different approaches, depending on the object and purpose of the agreement concerned. They all aim, however, to promote access to technologies and, in some cases, to develop local capabilities in developing countries, particular least developed countries. The main question is how to enhance the effectiveness of international arrangements for transfer of technology and capacity building through

- The effective implementation of the agreed provisions related to transfer of technology;
- Creation of capacity in least developed countries to acquire and adapt technology.

The broader challenge concerns the establishment and maintenance of effective access, on a fair commercial basis, to potent sources of technology and the setting up of mechanisms for its successful deployment within the economy.

5. To facilitate the discussions, the UNCTAD secretariat has prepared an issues paper on "International arrangements on transfer of technology: best practices for access to and measures to encourage transfer of technology with a view to capacity building in developing countries, especially in least developing countries" (TD/B/COM.2/EM.9/2). The paper is complemented by a compendium of international arrangements on transfer of technology: selected instruments (UNCTAD/ITE/IPC/Misc.5). In addition, experts are encouraged to prepare brief papers on the subject under discussion. These papers will be made available at the Meeting in the form and language in which they are received.

Documentation

TD/B/COM.2/EM.9/2	International arrangements on transfer of technology: Best practices for access to and measures to encourage transfer of technology with a view to capacity-building in developing countries, especially in least developed countries. Issues note by the UNCTAD secretariat
UNCTAD/ITE/IPC/Misc.5	Compendium of international arrangements on transfer of technology: selected instruments

Item 4 - Adoption of the outcome of the Meeting

6. The Expert Meeting will adopt its outcome, which will be assessed by member States before being submitted to the Commission on Investment, Technology and Related Financial Issues in January 2002. The final report will be compiled under the authority of the Chairperson after the conclusion of the Meeting.

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INTERNATIONAL ARRANGEMENTS FOR TRANSFER OF TECHNOLOGY: BEST PRACTICES FOR ACCESS TO AND MEASURES TO ENCOURAGE TRANSFER OF TECHNOLOGY WITH A VIEW TO CAPACITY BUILDING IN DEVELOPING COUNTRIES, ESPECIALLY IN LEAST DEVELOPED COUNTRIES

Issues note by the secretariat

EXECUTIVE SUMMARY

The concerns of the international community with regard to encouraging the transfer of technology to developing countries, as well as concerning their technological capabilities, are enshrined in several dozen international instruments. The technology-related provisions contained in such instruments follow different approaches, depending on the object and purpose of the agreement concerned, and are underpinned by a variety of shared concerns: effective integration of the developing countries in world trade and investment, protection of intellectual property rights and sustainable development. They all aim to promote access to technologies and, in some cases, the development of local capabilities in developing countries, in particular in least developed countries. The main questions are how to ensure the effectiveness of international arrangements for transfer of technology and capacity building and what are the best mechanisms for their successful implementation.

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Table 1 Example of main types of existing home country measures encouraging transfer of technology

Introduction

1. The need for technology transfer, especially to developing countries, has been recognised in various international fora. Over 80 international instruments and numerous sub regional and bilateral agreements contain measures related to transfer of technology and capacity building. In the Bangkok Plan of Action, UNCTAD was requested to "analyse all aspects of existing international agreements relevant to transfer of technology" and "examine and disseminate widely information on best practices for access to technology"(paragraphs 117 and 128)[1]. Towards this end, the Expert Meeting is expected to consider: the coverage of agreements (spread of provisions on transfer of technology); the effectiveness of their implementation (how are they operationalized?); and improvements (what can be done to enhance their impact on transfer of technology?). The main issue is how to enhance the effectiveness of international arrangements, i.e. how to translate good intentions into good practices.

2. This note presents brief background information on the subject, and poses issues and questions for discussion. Section I will deal with the general context in which access to technology and capacity building are expected to take place, and section II will focus on various arrangements made at the international level to facilitate access to technology and its transfer.

I. Access to technology and capacity-building : general context[2]

3. In the knowledge-based global economy, the abilities to acquire and adapt successfully technologies from both external and internal sources and to create new technology are critical determinants of a country's ability to compete successfully. While this statement applies to all countries, it is evident that the transfer of technology from abroad is the most important potent source of technologies for developing countries, especially least developed countries. The challenge is to establish and maintain effective access to these technologies and to devise mechanisms for deploying them effectively within the economy.

4. Technology transfer should be viewed as a dynamic and evolving process that requires constant adaptation by all actors. As a process, transfer of technology should be understood to mean both the successful learning of information by one party from another party, and effective application of that information in generating marketable products and services. Such transfers are costly and require investment by both parties in a process with uncertain outcomes.

5. The dynamic process of technology transfer responds positively to investment protection through intellectual property rights (IPRs), normally patent and trade secret laws. Moreover, the technological sophistication of the information transferred through these channels often depends on the local structure of IPRs. Strengthening IPRs could increase the costs of acquiring and diffusing modern technologies to the extent that their suppliers can negotiate higher license fees and royalties and exert tighter control over local uses. Under

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[1] UNCTAD (2000a).

[2] This section draws on earlier work of the secretariat in this field, including discussions held with external experts in the course of preparations for UNCTAD X.

certain circumstances, the exercise of IPRs in licensing technology may distort the market or create inefficiencies, for example by limiting access to potential licensees and competitors.

6. The global regime for protecting technology development and technology acquisition has changed considerably since the TRIPS Agreement entered into force within the larger framework of the World Trade Organization (WTO). The Agreement requires the specification and implementation of minimum standards for protection of Trade-Related Aspects of Intellectual Property Rights, which should strengthen incentives for innovation and technology trade in the long term[3]. However, the developing countries expressed concerns that TRIPS and other WTO Agreements contain few measures to facilitate and promote access to technology in the short and medium terms.

7. The technological gap between developed and most developing countries is wide. Flows of advanced technological knowledge today tend to be more closely associated with FDI and licensing in technologically sophisticated industries. These activities have largely been concentrated in a few regions or countries[4]. While the share of high technology products in world exports of manufactures has gone up, rising from around 14 per cent in 1980 to about 23 per cent in 1996[5], only a small number of developing countries, mainly in East Asia and Latin America, export high and medium technology products - the most dynamic segment of world trade.

8. In principle, the technological gap may be bridged through the transfer of technology from producers to users by means of the market and other mechanisms. New technologies such as information technology and electronic commerce could help the process if they are used effectively by recipient firms and countries, especially by small and medium-sized enterprises. Other technologies, such as environmentally sound technologies, biotechnological inventions, and new materials also present opportunities for developing countries that possess adequate skills, access to scientific and technical information, absorptive capacity, and financing for adoption and adaptation. However, there are also risks that access to these critical technologies may be limited in an overly protectionist intellectual property environment that does not properly balance incentive to innovate against the needs for dissemination of knowledge.

9. This knowledge includes both the know-how of processes for producing goods and services and the organisational and management information needed to produce and distribute goods and services efficiently. Technological knowledge is embedded in machinery, equipment, licensing agreements, and managerial skills. Opportunities to learn occur through other means such as training and access to the global stock of scientific and technical information. A key component of any transfer process is the effective transfer of the skills and intangible know-how that ensure production capability[6]. These can be of greater developmental value than the transfer of tangible goods and inputs.

10. Measures are needed to identify and control anticompetitive practices by rights holders and to reduce impediments to the transfer and dissemination of technology. Control

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[3] GATT-WTO (1994), and for an analysis of the Agreement, see UNCTAD (1996a).
[4] See UNCTAD (2000b), Part I.
[5] See UNCTAD (1999), Part I.
[6] See also UNCTAD (1996 b), Chapters III and IV.

of such practices is common in developed countries, but there is a lack of such legislation in many developing countries.[7]

11. The provisions on transfer of technology and capacity building in international agreements (that will be discussed in section (II)) are underpinned by a variety of shared concerns: effective integration of the developing countries in world trade and investment, protection of intellectual property rights and sustainable development.

II. Issues in international arrangements : implementation process

12. Since the 1970s, developing countries have expressed in various international fora their desire to improve access to foreign technologies and upgrade their technological capabilities. In view of the importance attributed to access to technology and capacity building, during the last two decades specific provisions on transfer of technology have been incorporated into various international instruments. These provisions have different objectives and scope, and different modes of implementation, including the provision of financing, and are subject to different terms and conditions. In most cases, however, such provisions contain only "best efforts" commitments, rather than mandatory rules. The question that arises is to what extent developing countries can benefit from these instruments.

13. In the context of transfer of technology and capacity building, two broad but overlapping categories of technology-related provisions in international instruments can be distinguished. The first category deals with standard setting to protect proprietary technology. Broadly speaking, the "standard setting" instruments attempt to provide a balance between rights and obligations of the creators and potential users of technology[8]. For instance, the basic principles of the TRIPS Agreement refer to criteria and objectives regarding the contribution that the protection and enforcement of IPRs should make to "the promotion of technological innovation and to the transfer and dissemination of technology" (Article 7). These instruments are essentially concerned with the availability, scope and use of IPRs. Though the TRIPS Agreement expressly refers to transfer of technology, concerns have been expressed about the lack of mechanisms in the Agreement to operationalize it, and the need to further develop this concept in future negotiations has also been indicated.[9]

14. The second category of instruments focuses more on direct measures for transfer of technology to and capacity building in developing countries, in particular in least developed countries. These instruments deal more with transfer of specific technologies, e. g. technologies for protection of human health and environment, technologies for conservation of biodiversity and technologies for exploration and exploitation of marine resources. While the first category of instruments essentially rely on national measures for their implementation, particularly home country measures in developed countries, the second category has generally in-built mechanisms, including provisions for financing. For instance, in the Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol)[10], the capacity of the parties to fulfil the obligations to comply with the control

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[7] See also UNCTAD (1997), Chapter V C.2.

[8] In this context, due to the IPRs system, inventions and creative works become commodities that may be transferred by commercial transactions, e.g. bought, leased or sold, and thus have their utilization and diffusion facilitated through investment, licensing or other transfer arrangements

[9] See Correa, Carlos (1999) and also UNCTAD (2000c), p. 230.

[10] UNEP (1989).

measures set out in the Protocol depends on the effective implementation of the financial co-operation and the transfer of technology[11]. The main features of the technology-related provisions can be analysed at different, but interrelated levels: the categories of addressees; the type of technologies; and the methods of implementation.

A. Category of addressees

15. One of the main features of the instruments on transfer of technology and capacity building has been that they distinguish between two categories of addressees, namely developed and developing countries. Some instruments make an even more specific distinction among the parties by identifying groups of countries. The most common among such distinctions has been the special identity accorded to the LDC's. The main objective of such distinctions is to assign differing obligations to different categories of addressees, so that technology can be transferred from countries with strong capabilities, i.e. developed countries, to countries with low capacities, i.e. developing countries, more particularly LDC's. Thus, the technology-related provisions refer specifically to developing countries or LDC's.

16. In some cases such provisions apply also to all contracting parties. For example, article 144 (b) of the Convention on the Law of the Sea (Law of the Sea)[12] stipulates that transfer of technology should be promoted in order that " all States Parties benefit therefrom". Similar provisions are also made in article 10.2 (c) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (The Basel Convention)[13] and article 4.1 (c) of the Kyoto Protocol[14]

17. Favourable treatment for developing and/or least developed countries, resulting in differentiated obligations with regard to implementation processes, is included, for example, in article 266 of the Law of the Sea, article 4.2 of the Vienna Convention for the Protection of the Ozone Layer (the Vienna Convention)[15], article 10.3 of the Basel Convention, article 4.5 of the Kyoto Protocol, and article 16 of the Convention on Biological Diversity (CBD)[16]. In some cases, the provisions specifically allude to least developed countries. This is notably the case of article 66.2 of the TRIPS Agreement (see box 1).

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[11] All the instruments referred to deal with transfer of technology issues either at a broad policy level or at a sector-specific level. However, an effort to arrive at a *comprehensive instrument* was made in the 1970s and 1980s in the form of the draft international Code of Conduct on the Transfer of Technology .The proposal to adopt an international code of conduct on transfer of technology clearly illustrates this concern. See Patel, Roffe and Yusuf (2000).
[12] United Nations (1994).
[13] UNEP (1992a).
[14] UNFCC (1994).
[15] UNEP (1985).
[16] UNEP (1992b).

Box 1. Favourable treatment

Agreement on Technical Barriers to Trade (TBT)[17], Preamble

"Recognising the contribution which international standardisation can make to the transfer of technology from developed to developing countries"

The Montreal Protocol, Preamble
"Acknowledging that special provision is required to meet the needs of developing countries, including the provision of additional financial resources and access to relevant technologies, bearing in mind that the magnitude of funds necessary is predictable, and the funds can be expected to make a substantial difference in the world's ability to address the scientifically established problem of ozone depletion and its harmful effects"

TRIPS Agreement, Preamble
"Recognizing also the special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base"

TRIPS Agreement, article 66.2

"Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base"

Agenda 21 of the Earth Summit in Rio[18], article 34.14

" (b)To promote, facilitate, and finance, as appropriate, the access to and the transfer of environmentally sound technologies and corresponding know-how, in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries for the implementation of Agenda 21"

B. Types of technology

18. Technology-related provisions are designed to deal with transfer of technology and capacity building for broad objectives or for specific targets, and the consequent obligations are to be met by one or several categories of addressees. For instance, GATS and the TRIPS Agreement both refer to technology in a broader sense, whereas the Law of the Sea deals specifically with marine technology and capacity building in the management, exploration and exploitation of marine resources. Provisions of the Vienna Convention and the Montreal Protocol are related to technologies for environmental protection. Some of these instruments provide a definition of technology (see box 2).

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[17] GATT/WTO (1994).
[18] UNEP (1992c).

Box 2. Definition of technology

Law of the Sea, Annex III. Basic conditions of prospecting, exploration and exploitation. Article 5 (8)

"For the purposes of this article, "technology" means the specialized equipment and technical know-how, including manuals, designs, operating instructions, training and technical advice and assistance, necessary to assemble, maintain and operate a viable system and the legal right to use these items for that purpose on a non-exclusive basis".

The Vienna Convention, article 1

"Alternative technologies or equipment" means technologies or equipment the use of which makes it possible to reduce or effectively eliminate emissions of substances which have or are likely to have adverse effects on the ozone layer".

Agenda 21, article 34.3.

"Environmentally sound technologies are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. This implies that when discussing transfer of technologies, the human resource development and local capacity-building aspects of technology choices, including gender-relevant aspects, should also be addressed. Environmentally sound technologies should be compatible with nationally determined socio-economic, cultural, and environmental priorities".

19. In the absence of a generally accepted definition of technology, the terms of a Convention should be interpreted in accordance with its ordinary meaning, in its context and in the light of the treaty's object and purpose (article 31.1 of the Vienna Convention on the Law of the Treaties)[19]. This implies that even in cases where the same terms are used in different instruments, the specific meaning attributed to such terms in a particular agreement should be established taking into account the context of the provision and the particular object and purpose of the treaty in question. For example, the object and purpose of the TRIPS Agreement is to establish minimum standards on intellectual property rights[20]. Hence, the reference in article 66.2 of the Agreement to encouraging "technology transfer" to least developed countries should be interpreted as alluding to technologies protected by patents and other intellectual property rights[21], and not to those freely available or in the public domain. Instead, references to technology in other instruments (e.g. articles 144 and 268 of the Law of the Sea, article 4 of the Kyoto Protocol, article 34 of Agenda 21) may be deemed to comprise protected as well as non-protected technologies.

20. Type of technology is also defined in terms of capacity building. An explicit aim of Agenda 21 is to "support indigenous capacity building", in particular in developing countries.

[19] United Nations (1980) and see also Aust (2000).
[20] See UNCTAD, (1996a).
[21] See, in particular, article 2 of the TRIPS Agreement.

so that they can assess, adopt, manage and apply environmentally sound technologies. Similarly, GATS refers to this specific issue in its annex on telecommunication (see box 3).

Box 3. Capacity-building

Agenda 21, article 34.14 (d)

"To support endogenous capacity-building...could be achieved through *inter alia*: (ii) Strengthening of institutional capacities for research and development and programme implementation; (iii) Integrated sector assessments of technology needs, in accordance with countries' plans, objectives and priorities as foreseen in the implementation of Agenda 21 at the national level"

GATS Annex on Telecommunications, 6. *Technical Cooperation*

(d)"Members shall give special consideration to opportunities for the least-developed countries to encourage foreign suppliers of telecommunications services to assist in the transfer of technology, training and other activities that support the development of their telecommunications infrastructure and expansion of their telecommunications services trade".

21. Type of technology is also related to the objective pursued by the technology-related provisions. In some cases, provisions explicitly define their objectives in terms of the results to be achieved or by describing the type of the activities to be undertaken. In others cases the objectives are defined in general terms, or are implicit and can be derived from the wording and context of the provision. An example of a detailed definition of the objectives of technology-related provisions is provided in the Law of the Sea, which details the "basic objectives" to be reached directly or through the competent international organisations. The strengthening of capabilities is also mentioned - as an objective of international cooperation - in the International Undertaking on Plant Genetic Resources for Food and Agriculture [22] (see box 4).

[22] FAO (1983).

Box 4. Objectives

Law of the Sea, Article 268. "Basic objectives

States, directly or through competent international organizations, shall promote:

(a) the acquisition, evaluation and dissemination of marine technological knowledge and facilitate access to such information and data;

(b) the development of appropriate marine technology;

(c) the development of the necessary technological infrastructure to facilitate the transfer of marine technology;

(d) the development of human resources through training and education of nationals of developing States and countries and especially the nationals of the least developed among them";

International Undertakings, article 6 (a)
"with the aim of enabling all countries to make full use of plant genetic resources for the benefit of their agricultural development".

The Cotonou Agreement-The New ACP-EC Agreement,[23] article 21
"Cooperation shall also support improving the quality, availability and accessibility of financial and non-financial services to private enterprises, both formal and informal; by:

(c) supporting institutions, programmes, activities and initiatives that contribute to the development and transfer of technologies and know-how and best practices on all aspects of business management".

22. In some instruments, the technology-related provisions are less explicit, but the object and purpose of the actions to be undertaken are described in some detail. Thus, the Vienna Convention stresses the need to conduct research and scientific assessments (article 3.1), encourages the exchange of scientific, technical, socio-economic, commercial and legal information (article 4.1 and Annex II) and refers to cooperation for the acquisition of technologies and equipment, as well as training (article 4.2). Unlike the Law of the Sea and Agenda 21, the Vienna Convention focuses more on access to technology rather than on the development of local capabilities.[24] In other instruments, the section dealing with the general framework indicates areas where measures may be taken, for instance in the Cotonou Agreement.

C. Methods of implementation

23. Another key feature of provisions related to technology is their method of implementation. As the transfer of technology is a central element in many instruments,

[23] European Commission (2000).

[24] It should be noted that many instruments include provisions which specifically relate to technology (e.g. article 19 (g) of the Energy Charter), while others deal simultaneously with scientific and technological matters (e.g. article 5 (b) of the Kyoto Protocol; article 16.19 of Agenda 21). In some cases, the object of the provisions is exclusively scientific activities (e.g. article 143 of the Convention on the Law of the Sea; article 3 of the Vienna Convention). The Law of the Sea deals specifically with transfer of technology in marine technology and capacity building in the management, exploration and exploitation of marine resources.

capacity building often has as its objective enabling the developing country members to comply with their commitments under the instruments dealing with specific types of technology (as discussed in B).

24. The actual implementation of the identified provisions will depend on the legal nature of the instrument in terms of its voluntary or legally binding nature, on the hortatory or mandatory character of the relevant provisions, and on the wording used to define and the conditions applied to the obligations at stake. Some of the selected instruments (International Undertaking,[25] Agenda 21) are non-legally binding in nature. This means that any state action that is in conformity with their provisions should be deemed legitimate under international law, but no party is strictly obliged to comply with the instrument. Despite the "soft" nature of these agreements, their negotiation, interpretation, or amendment is often as complex and difficult as in the case of binding agreements, since non-binding rules create international precedents[26]. Given their non-binding nature, this type of instruments may include statements intended to establish concepts or principles, without a prescriptive intent[27].

25. The international instruments that are legally binding in nature contain, in principle, mandatory provisions that require certain positive or negative action by the contracting parties. In some cases, the required conduct is clearly spelled out. Article 66.2 of the TRIPS Agreement provides an example of an obligation imposed on developed countries, who "shall provide incentives to enterprises and institutions" in their territories. Though this provision leaves great leeway to member countries to determine what kind of incentives to apply, it does positively require the establishment of some system of encouragement of transfer of technology (any type of technology protected under intellectual property rights) to LDCs. The provision also provides a general objective to possibly assess the appropriateness of such incentives, since they should enable least developed countries "to create a sound and viable technological base". The question may be raised as to whether non-compliance with any provision of the TRIPS Agreement, including article 66.2, may give rise to complaints by the affected members under the Dispute Settlement Understanding[28]. It should be noted that an authoritative interpretation of the WTO rules can only be made by the Member States. The recommendations and rulings of the Dispute Settlement Body cannot add to or diminish rights and obligations provided in the covered agreements (article 3.2 of the Dispute Settlement Understanding)[29].

26. Treaties usually give rise to numerous divergences about their interpretation. In some cases, contracting parties may issue agreed interpretations in order to clarify existing provisions[30]. For instance, under WTO rules it is possible to develop agreed interpretations[31] which, unless otherwise provided, require a three-fourths majority (Article IX of the Marrakesh Agreement Establishing the WTO). Another mechanism that may be used, if

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[25] The revision of the International Undertaking, currently under negotiation in the framework of the Commission on Genetic Resources, may lead to the adoption of a legally binding instrument.

[26] See, for instance, "Part II: Historical perspective and reflection" in Patel, Roffe and Yusuf (Ed.), *op cit*.

[27] See, e.g., article 16.10 of Agenda 21 (Human resource development: Training of competent professionals in the basic and applied sciences at all levels... is one of the most essential components of any programme of this kind. Creating awareness of the benefits and risks of biotechnology is essential").

[28] GATT/WTO (1994), Annex 2.

[29] Binding *inter partes* (the Appellate Body and also the Panels refer frequently to earlier decisions)

[30] See also Jackson (2000), in particular page 184.

[31] It should be noted that the interpretation of the WTO rules can only be made by the Member States. The recommendations and rulings of the Dispute Settlement Body cannot add to or diminish rights and obligations provided in the covered agreements (article 3.2 of the Dispute Settlement Understanding).

provided for by the treaty, is to adopt protocols on particular subjects, as allowed by the Vienna Convention[32] and by the CBD[33]. Such protocols make it possible to clarify and develop treaty provisions, and to establish specific mechanisms for the implementation of parties' obligations.

27. Given differences in addressees, type of technology and objectives of international instruments, it is logical to expect instruments to provide for different methods of implementation. The ways in which such provisions can be executed involve a wide range of methods in line with the established differentiated obligations, as referred to in the previous subsection. Such methods of implementation incorporate different modalities: (i) in built mechanisms; (ii) national measures; and (iii) terms and conditions of transfer.

(i) In-built mechanisms

28. Some agreements have in-built mechanisms, either in the form of international cooperation, which may require the intervention of international organizations, or in the form of a special institutional set up for implementation of the provisions e.g. Law of the Sea (see Box 5).

[32] The Montreal Protocol was developed in the framework of this Convention, considering, inter alia, "the importance of promoting cooperation in the research, development and transfer of alternative technologies relating to the control and reduction of emission of substances that deplete the ozone layer, bearing in mind in particular the needs of developing countries".

[33] In the course of the negotiations for the revision of the International Undertaking, one option under consideration has been to adopt the revised Undertaking as a protocol to the CBD.

Box 5. Institutional set-up

Law of the Sea, article 144
"Transfer of technology

1. The Authority shall take measures in accordance with this Convention:
   (a) to acquire technology and scientific knowledge relating to activities in the Area; and
   (b) to promote and encourage the transfer to developing States of such technology and scientific knowledge so that all States Parties benefit therefrom.

2. To this end the Authority and States Parties shall co-operate in promoting the transfer of technology and scientific knowledge relating to activities in the Area so that the Enterprise and all States Parties may benefit therefrom. In particular they shall initiate and promote:
   (a) programmes for the transfer of technology to the Enterprise and to developing States with regard to activities in the Area, including, *inter alia*, facilitating the access of the Enterprise and of developing States to the relevant technology, under fair and reasonable terms and conditions;
   (b) measures directed towards the advancement of the technology of the Enterprise and the domestic technology of developing States, particularly by providing opportunities to personnel from the Enterprise and from developing States for training in marine science and technology and for their full participation in activities in the Area".

29. Under this method, an interesting case aiming at facilitating transfer of technology to developing countries is offered by the Montreal Protocol. The addressees are developing countries, whose capacity to fulfil the obligations concerning the phase-out of ozone-depleting substances (ODS) depends upon effective implementation of the financial cooperation and transfer of technology (Articles 5, 10 and 10A). Transfer of technology and related provisions on financing are based on the objective/target that ODS, e.g. chlorofluorocarbons (CFCs), should be eliminated by both developing and developed countries. On the basis of the Protocol's flexibility[34] and, consequently, the established differentiated obligations for developing countries, not only is a grace period is granted for phasing out the use and production of ODS but also a financial mechanism has been established for transfer of technology for the benefit of these countries. Moreover, the implementation of the agreed obligations by developing countries is made dependent upon the effective implementation by developed countries of the financial cooperation and transfer of technology provisions of the Protocol. Thus, for the fulfilment of the differentiated obligations of parties, a specific method of implementation is built into the Protocol itself. Accordingly, a Multilateral Trust Fund was established in order to assist the developing countries to leapfrog by meeting the specific and obligatory ODS phase-out requirements and to facilitate transfer of technology for conversion of equipment using ODS and the production of alternatives to ODS. An Executive Committee was also created to administer and monitor the actual technology transfer and supervise the disbursement of funds. The Multilateral Fund began its operation in 1991. As at 28 February 2001, the contributions

[34] The ability of an international instrument to be adapted to the particular conditions prevailing in developing countries and to the realities of the economic and technological asymmetries between these countries and developed countries. See UNCTAD (2000d).

made to the Fund by some 32 industrialized countries amounted to US$1.22 billion. The Fund has supported about 3,460 projects and activities in 124 developing countries.[35]

30. Despite this major effort for transfer of technology, there are indications that the costs relating to IPRs, including royalties, have not always been accommodated by the Multilateral Fund. It was suggested that a compensation mechanism be established in order to enable developing countries to meet the increasing costs of technologies covered by IPRs.[36]

31. Questions may be raised as to what extent such mechanisms combining financial provisions and transfer of environmentally sound technologies, including propriety ones, and monitoring arrangements[37] could be emulated in the area of more general types of technology, e.g. relating to infrastructure, health, nutrition and telecommunication.

32. The implementation mechanisms referred to in this note generally do not make a clear distinction between transfer of technology and capacity building. However, Agenda 21 refers specifically to the requirements of technological capacity building and the Cartagena Protocol emphasises transfer of technology for capacity building (see box 6).

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[35] Similarly, the Global Environment Facility as the financial mechanism of the Convention on the Biodiversity, provides financial support to technology capacity building activities through enabling activity, regular projects and short-responses measures. Over US$1 billion has been committed by the facility to support projects in the area of biological diversity.

[36] UNCTAD (2000e), page 63.

[37] The instruments dealing with transfer of technology in specific sectors establish mechanisms to monitor and facilitate States parties' implementation of and compliance with their obligations. The process of establishing such mechanisms in international environmental agreements has been seen as an important contribution to the international law of cooperation. See Robin R. Churchill and Ulfstein, Geir (2000).

Box 6. Requirements for capacity-building

Agenda 21, article16.11

"Institutional upgrading or other appropriate measures will be needed to build up technical, manage
rial, planning and administrative capacities at the national level to support the activities in this programme area. Such measures should be backed up by international, scientific, technical and financial assistance adequate to facilitate technical cooperation and raise the capacities of the developing countries".

Cartagena Protocol on Biosafety[38], article 22

"1. The Parties shall cooperate in the development and/or strengthening of human resources and institutional capacities in biosafety, including biotechnology to the extent that it is required for biosafety...
2. For the purposes of implementing paragraph 1 above, in relation to cooperation, the needs of developing country Parties, in particular the least developed and small island developing States among them, for financial resources and access to and transfer of technology and know-how in accordance with the relevant provisions of the Convention, shall be taken fully into account for capacity-building in biosafety. Cooperation in capacity-building shall, subject to the different situation, capabilities and requirements of each Party, include scientific and technical training in the proper and safe management of biotechnology, and in the use of risk assessment and risk management for biosafety, and the enhancement of technological and institutional capacities in biosafety. The needs of Parties with economies in transition shall also be taken fully into account for such capacity-building in biosafety".

33. Many of the agreements provide for technical assistance, training and exchange of information. Often, the provision of technical assistance is established in general terms, but in other cases their purpose is more precisely defined. However, provisions related to technical assistance are not necessarily relevant to local technological capacity building. Article 274 (c) and (d) of the Convention on the Law of the Sea, for instance, focus on technical assistance for the acquisition of "skills and know-how" and of "equipment, processes, plant and other technical know-how". The provisions related to training and exchange of information also follow a similar pattern.

(ii) National measures

34. Many technology-related provisions rely on national measures, particularly home country measures (HCM) in developed countries, for their implementation. This feature is particularly common in those instruments that are standard-setting ones and deal also with transfer of technology often without determining a specific target to reach. The adoption of measures by all contracting parties (but having especially in view developed countries) is provided, for instance, by articles 16.3 and 4 of the CBD, which require the adoption of "legislative, administrative or policy measures, as appropriate" to provide access to, the transfer of and the joint development of technology. The adoption of home country measures

[38] UNEP (2000).

only by developed countries is to be found, for example, in article 66.2 of the TRIPS Agreement as an obligation for developed countries, which "shall provide incentives to enterprises and institutions in their territories" in order to promote and encourage transfer of technology to LDCs to "enable them to create a sound and viable technological base".

35. It should be noted that these measures are generally part of measures taken by developed countries to support outward FDI[39]. Such support can include commercial, strategic and humanitarian motivations, or response to international commitments and obligations. To the extent that technology is part of the package offered by the foreign investor, the promotion of FDI can also contribute to the transfer of technology. It is important to note, however, that transfer of technology goes beyond technology transfer entailed in most of the FDI-related measures. There are also measures by home countries geared specifically to the facilitation of transfer of technology (table 1).

36 With regard to implementation of commitments in international instruments, developed countries have undertaken to provide information regarding their measures relevant to Article 66.2 of the TRIPS Agreement, namely provision of incentives to enterprise and institutions in their territory. Types of measures taken include export and investment promotion, export finance and other financial incentives, including tax credits and loans, infrastructure projects and provision of training, and technical information, including technical assistance and expertise[40]. The information provided to the Council for TRIPS also covers contributions to regional and multilateral technical cooperation funds. Most of the information did not make a distinction between the measures benefiting LDCs and those benefiting other developing countries.

37 Although the measures are not always specifically dedicated to transfer of technology to developing countries, it is, however, possible to identify some examples. The Technology Partnership Initiative of the United Kingdom encourages partnership between firms in the United Kingdom and firms in developing countries, with special emphasis on environmentally friendly technologies; and the EU Asia-Ecobest programme of the Regional Institute of Environmental Technology (RIET) promotes the use of technologies adapted to Asian environmental needs through the provision of ad hoc technical assistance and expertise. Similarly, the Japanese International Cooperation Agency (JICA) provides for the transfer of specialized technical knowledge in areas such as health, agriculture, forestry and fisheries, mining and manufacturing. On the other hand, Infrastructure and Economic Co-operation (INEC), under the Swedish International Development Co-operation Agency (SIDA) is involved in the preparation of feasibility studies and projects in various technological fields including telecommunications and energy. Mention should be made of The Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), France, which undertakes joint research activities on genetic resources, food, nutrition technologies and biotechnology of interest to developing countries with R&D institutions in more than 90 countries.[41] Finally, provisions for training and

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[39] See UNCTAD (2000f).

[40] For information provided by the above countries to the Council for TRIPS, see WTO (1999/2000).

[41] Mention should made of some HCMs that restrict technology transfer for reasons of national security or economic competitiveness. For example, most developed countries implement a system of export (and technology transfer) controls for dual-use goods and technologies with significant military applications, and

education targeted more specifically towards LDCs are included in the aid programmes of the United States and Australia.

Table 1. Examples of main types of existing home country measures encouraging transfer of technology

Selected developed countries	Partnerships	Promoting the use of specific technology	Provision of expertise		Research and development
			Advisory services	Training and education	
European Union	x	x	x	-	x
Australia	-	-	x	x	-
Austria	-	-	-	x	x
Belgium	x	-	-	x	-
Canada	x	x	x	x	x
Denmark	x	-	x	-	x
Finland	-	x	-	-	-
France	x	-	x	x	x
Germany	-	-	x	x	-
Japan	-	-	x	x	-
Netherlands	-	x	x	-	-
New Zealand	x	-	x	-	-
Norway	x	x	x	x	-
Spain	x	-	x	-	-
Sweden	-	-	x	x	x
Switzerland	-	x	x	x	-
United Kingdom	x	x	x	x	x
United States	x	x	x	x	-

Source: UNCTAD, based on information from various sources including websites (see list of references), publications of relevant agencies, and WTO documents IP/C/W/132/Add.1-7.

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coordinate their actions through the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies adopted in 1991.

(iii) Terms and conditions of transfer

38. The effectiveness of implementation depends also on the terms and conditions under which transfer of technology takes place. Different agreements have different terms. In some agreements provisions call for "fair and reasonable terms", whereas some other agreements emphasize the commercial nature of such transfer (see box 7)[42].

Box 7. Terms and conditions for the transfer of technology

Law of the Sea: "on fair and reasonable terms and conditions" (article 266.1); "favourable economic and legal conditions for the transfer of marine technology for the benefit of all parties concerned on an equitable basis" (article 266.3).

The Montreal Protocol: "on fair and most favourable conditions" (article 10A (b)).

Agenda 21: "on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries" (article 34.14).

The Energy Charter Treaty[43]: "on commercial and non-discriminatory basis" (article 8.1).

39. Another explicit term in the implementation process refers to the respect of intellectual property rights. This condition is explicit in particular in the instruments adopted since the 1990s, but it is also present in earlier instruments. Thus, article 267 of the Law of the Sea refers in a balanced manner to "all legitimate interests, *inter alia*, the rights and duties of holders, suppliers and recipients of marine technology". In more recent instruments, and in line with the overall trend towards the strengthening and expansion of intellectual property protection, emphasis is given to the protection of the interests of technology holders, as illustrated by the text incorporated in the CBD (see box 8).

[42] For a more detailed analysis of issues in international investment agreements (IIAs), see UNCTAD series on issues in international investment agreements 1998-2000, in particular UNCTAD (2000d).
[43] European Union (1991).

Box 8 IPRs

CBD, article 16.2

"In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights.
Article 16.5. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives"

Desertification Convention,[44] article 18

"The Parties shall
(b) facilitate access, in particular by affected developing countries Parties, on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights, to technologies most suitable to practical application for specific needs of local population."

40. It is interesting to note that, despite the clear recognition of the need for an "effective protection" of intellectual property rights, article 16.5 of the CBD aims at balancing this approach by indicating that cooperation may be necessary to ensure that such rights do not limit or impede the implementation of the Convention. Agenda 21 is more explicit on this subject, and while requiring that account be taken of the need to protect intellectual property rights (article 34.14 (b)), it encourages the adoption of measures "to prevent abuses" of such rights, including through compulsory licenses with the provision of "equitable remuneration" to the right holder (article 34.18 (e)). Conditions relating to intellectual property rights can also be found, *inter alia*, in the Energy Charter (article 19.1 (h)). The Berne Convention for the Protection of Literary and Artistic Works[45] permits any developing country to grant non-exclusive and non-transferable licenses to its nationals for reproduction or translation of copyright protected works for teaching and scientific research purposes (Appendix IX).

41. Finally, mention should be made of bilateral treaties for protection and promotion of foreign investments. Some of these instruments refer to transfer of technology in such a way that it could not be used as a performance requirement[46] (see box 9).

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[44] Convention to Convert Desertification in those countries experiencing serious drought and/or desertification, particulalry in Africa, UNCCD (1994).
[45] WIPO (1992).
[46] For an analysis of bilateral investment treaties, see UNCTAD (1998).

Box 9. Transfer of technology under BITs

Canada-Chile Free Trade Agreement[47], article G-06: Performance Requirements

"1. Neither Party may impose or enforce any of the following requirements, or enforce any commitment or undertaking, in connection with the establishment, acquisition, expansion, management, conduct or operation of an investment of an investor of a Party or of non Party in its territory: (f) to transfer technology, a production process or other proprietary knowledge to a person in its territory, except when the requirement is imposed or the commitment or undertaking is enforced by a court, administrative tribunal or competition authority to remedy an alleged violation of competition laws or to act in a manner not inconsistent with other provisions of this Agreement"

III. Conclusions and possible issues for the consideration of the Expert Meeting

42. This note has briefly highlighted the general context of transfer of technology and capacity building and the major categories of existing technology-related provisions in international instruments. The technology-related provisions contained in such instruments follow different approaches, depending on the object and purpose of the respective instruments. They all aim, however, to promote access to technologies and, in some cases, the development of local capabilities in developing countries. The note may not have covered all concerns, but these and any other relevant concerns may call for continuing discussion on transfer of technology.

43. The adoption of technology-related provisions may be seen as an expression of States' willingness to cooperate multilaterally in order to redress or reduce the asymmetric distribution of scientific and technological capabilities in the world. There has been some success in implementation, but more needs to be done in order to ensure that the various commitments are truly implemented. A considerable gap seems to exist between the intentions expressed in the agreed provisions and their effective implementation.

44. Two categories of addressees has been identified, namely developed and developing countries. The main objective of this distinction is to assign differing obligations to different categories of addressees with regard to transfer of technology and capacity building. These in turn depend for their implementation on the types of technologies involved and whether they are part of a broad objective or a specific target of the instrument in question. Given the differences in addressees, types of technologies and the objectives of international instruments, it is to be expected the methods of implementation will be different. Those instruments with a specific target (such as ESTs) generally have an in-build mechanism of implementation including financial provisions. However, those instruments dealing with transfer of technology as a broad objective often rely on national measures in developed country addressees for their successful implementation.

45. Often implementation of obligations in the former instruments by one party is dependent upon implementation of commitments by other party with regard to transfer of

[47] Canada (1998).

technology and financial provisions. The type of technologies and methods of implementation influence the formulation of the terms and conditions of transfer. Generally, provisions dealing with "targeted transfer" call for "fair and reasonable terms", and agreements with non-specific targets (for example, transfer of technology in general) emphasize the commercial nature of such transfer.

46. The preceding paragraphs have drawn attention to some specific mechanisms for implementation. However, more information on the impact of these mechanism is required in order to gain a better understanding of their effectiveness and their possible emulation in other international agreements. The Expert Meeting offers an excellent opportunity to explore this issue. Towards this end, the Expert Meeting might wish to address, among others, the following questions:

- Have technology-related provisions led to transfer of technology to developing countries? Have they led to the formulation of measures by developed countries that strengthen the transfer of technology to and the enhancement of the technological capabilities in developing countries?

- To what extent could mechanisms for implementation combining the transfer of technology and financial provisions, as in the Montreal Protocol, along with monitoring arrangements, be emulated in other areas such as infrastructure, health, nutrition and telecommunication?

- Do the modalities for implementation identified in international instruments take full account of the needs of LDCs? If not, how can they be improved?

- Are there any innovative measures for transfer of technologies, including proprietary knowledge, that can be emulated as best practices by developing partners?

- What host country measures can be adopted to enhance the implementation of international instruments?

- To what extent can instruments such as competition policy, including compulsory licensing, be used to promote transfer of technology?

- Will measures aimed at facilitating access to developed country markets can help induce technology capacity building in developing countries, particularly LDCs?

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REPORT OF THE EXPERT MEETING ON INTERNATIONAL ARRANGMENTS FOR TRANSFER OF TECHNOLOGY: BEST PRACTICES FOR ACCESS TO AND MEASURES TO ENCOURAGE TRANSFER OF TECHNOLOGY WITH A VIEW TO CAPACITY-BUILDING IN DEVELOPING COUNTRIES, ESPECIALLY IN LEAST DEVELOPED COUNTRIES

Held at the Palais des Nations, Geneva
27 to 29 June 2001

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Chapter I

INTERNATIONAL ARRANGEMENTS FOR TRANSFER OF TECHNOLOGY

Outcome of the Expert Meeting

1. The Expert Meeting on International Arrangements for Transfer of Technology examined a range of issues for consideration by the Commission on Investment, Technology and Related Financial Issues pursuant to paragraphs 117 and 128 of the Bangkok Plan of Action (TD/386)[1/]. Experts made presentations and exchanged views on experiences and best practices at the international and national levels.

2. Experts noted that, in the knowledge-based global economy, technology plays an ever-important role in economic development. The concerns of the international community with respect to enhancing the transfer of technology to developing countries, in particular to the least developed countries, as well as their technological capabilities, are reflected in several dozen international instruments. These instruments express the willingness of development partners to cooperate multilaterally. There has been some success in implementation, but more needs to be done. The availability of information on arrangements for transfer of technology is an essential requirement for sustained multilateral cooperation. In this connection, the *Compendium* on transfer of technology-related provisions[2/] is a welcome contribution and should be continuously updated, as necessary, and widely disseminated, including through electronic media.

3. Experts also noted that most technology-related provisions are of a "best-efforts" nature. Governments, as well as civil society and the private sector, have an important role to play in the implementation of commitments, *inter alia* through public and private partnerships. In this connection, experts emphasized the importance of adequate protection of intellectual property in providing incentives for investment and transfer of technology in all countries, including in developing countries, taking into account the interests of producers, users and consumers.

4. Experts examined a number of best practices that can contribute to generating favourable conditions and opportunities for transfer of technology and capacity building. Some of these practices include the following:

(a) International instruments with built-in implementation mechanisms, including financial provisions and monitoring arrangements, have a promising implementation record and should be emulated. These

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1/ Paragraph 117: "UNCTAD should analyse all aspects of existing international agreements relevant to transfer of technology". Paragraph 128: "In the area of transfer of technology, UNCTAD should examine and disseminate widely information on best practices for access to technology".

2/ Compendium of International Arrangements on Transfer of Technology: Selected Instruments (UNCTAD/ITE/IPC/Misc.5).

instruments are relatively few and mainly for purposes of the public good, such as environmental protection. Nevertheless they can serve as a model in other areas such as infrastructure, health, nutrition and telecommunication;

(b) Ensuring the access, in particular of developing countries, to technological information, including information on state-of-the-art technologies on a competitive basis and on fair and equitable terms and conditions, in addition to information available from the public sources;

(c) Taking measures to prevent anticompetitive practices by technology rights holders or the resort to practices which unduly impede the transfer and dissemination of technology. Control of such practices is quite common in developed countries, but there is a lack of legislative measures in this regard in many developing countries. In particular, the development of relevant legislation at either the national or regional level is considered to be a promising option;

(d) Taking into account the possible short and medium-term costs, local working requirements, if applied in a manner that is consistent with the TRIPS Agreement and the Paris Convention, may be one way of enhancing transfer of technology;

(e) Making the TRIPS Agreement more conducive to transfer of technology, in accordance with its Articles 7, 8 and 40, including by reviewing its impact on transfer of technology and capacity building;

(f) Setting up of interministerial coordination committees at the national/regional level with regard to the interface between commitments in the TRIPS Agreement and national implementation requirements with a view to adjusting the TRIPS standards to local innovation needs and to favouring their pro-competitive implementation. UNCTAD should assist interested countries in establishing such committees by undertaking a needs assessment in the context of the ongoing programme of science, technology and innovation policy reviews;

(g) Establishing a special trust fund, based on successful models, to promote research and development in developing countries and other activities in the area of technology with a view to assisting developing countries in benefiting from their various international commitments;

(h) Designing measures and specific incentives for home-country enterprises, including fiscal and other incentives, to promote transfer of technology, especially through FDI in developing countries. In this connection, the

monitoring of implementation of the commitments in Article 66.2 of the TRIPS Agreement could contribute to building a sound and viable technological base in LDCs. UNCTAD should compile an illustrative list of home-country measures that might fulfil the requirements of Article 66.2;

(i) Supporting capacity-building, in particular in LDCs, through specific projects and programmes and by establishing a scientific and technological infrastructure on a cooperative basis for both the public and private research facilities so to enable them to assess, adopt, manage, apply and improve technologies;

(j) Creating a hospitable domestic regulatory environment for foreign investment, along with intellectual property protection, encourages access to the newest technology. It has been observed that the transfer of technology, is often most successful when accomplished by means of investment, specially by FDI. In this connection, technical cooperation should focus on technological capacity building with a view to enabling beneficiary countries to use intellectual property rights properly in ways that advance their national systems of innovation;

(k) Supporting transfer of technology and capacity building for enhancing the use of electronic commerce in developing countries, in particular by their small and medium sized enterprises, including enhancing the use of information and technologies in the public domain;

(l) The provision by host countries of an enabling environment for transfer of technology, taking into account the following considerations:

- Vocational training and recruitment of technical staff;
- Relationships with local public or private research centres and consultancy firms;
- Joint efforts by enterprises and Governments;
- Encouraging capacity building for assessing, adopting, managing, and applying technologies through *inter alia*: human resources development, strengthening institutional capacities for research and development and programme implementation, assessments of technology needs, and long-term technological partnerships between holders of technologies and potential local users.

5. UNCTAD should provide assistance to developing countries, in particular least developed countries, to strengthen their capacity for discussing and for negotiating technology transfer provisions in international instruments. UNCTAD should further explore ways and means for effective implementation of international commitments in the area of transfer of technology and capacity-building.

Chapter II

CHAIRPERSON=S SUMMARY OF DISCUSSIONS

1. The discussions of the Expert Meeting on agenda item 3 were structured according to the following two themes:

(a) Access to technology and capacity-building: general context;

(b) Issues in international arrangements: implementation process.

Discussions of the latter theme concentrated on categories of addressees, types of technology, and methods of implementation.

2. In his opening address, the Deputy Secretary-General of UNCTAD stressed the importance of the guiding principles set out in the UNCTAD X Plan of Action and the Bangkok Declaration aimed at the promotion of a "true partnership≅ between all countries based on inclusiveness, transparency and participation for all. As production was increasingly knowledge-intensive, the issue of transfer of technology and technological capacity-building in developing countries had become critical for attaining competitiveness and sustained growth in developing countries. Development policy should therefore be based on efforts to increase the ability of developing countries to access knowledge in order to enable them to compete for markets, accelerate economic growth and improve the situation of the poorer segments of society. Emphasizing the concerns of the international community with respect to enhancing the transfer of technology to developing countries, as well as their technological capabilities, he stressed that the technology-related provisions contained in international instruments all aimed to promote access to technologies and, in some cases, to develop local capabilities in developing countries, particular least developed countries. The main question was how to enhance the effectiveness of international arrangements for transfer of technology and capacity building through the effective implementation of the agreed provisions related to transfer of technology; and creation of capacity in least developed countries to acquire and adapt technology.

3. The Chairperson pointed out that it was recognized that the ability to create, acquire and adapt technologies constituted a critical determinant of a country's development process and participation in international trade. He stressed that the issues under the purview of the Expert Meeting were important, as they related to opportunities and challenges for transfer of technology and capacity-building that could be offered by international agreements. The technology-related provisions contained in such instruments followed different approaches, depending on the object and purpose of the agreement concerned, and were underpinned by a variety of shared concerns: effective integration of developing countries into world trade and investment, protection of intellectual property rights and sustainable development. The main questions were how to ensure the effectiveness of international arrangements for transfer of

technology and capacity building and what the best mechanisms were for their successful implementation.

4. In his introduction to agenda item 3, the Chief of the Investment Policies and Capacity-building Branch of the UNCTAD Division on Investment, Technology and Enterprise Development stressed that obtaining technology from abroad remained important to most developing countries, but it was today seen primarily as a means of accomplishing the more fundamental goal of building technological capacities. Technology transfer was a process, not a one-off transaction. Transfer of technology involved the successful learning of information by one party from another party, and the effective application of that information in generating marketable products and services. For this to happen, enterprises and the building of a sound technological base were key. At the same time, the challenge remained to establish and maintain effective access to these technologies and to devise mechanisms for deploying them effectively within the economy. National policies played a key role in this regard, through attracting foreign direct investment and technology, streamlining of approval procedures and fewer provisions on technology transfer or other operating requirements. However, international arrangements also had a role to play. The need for technology transfer had been recognized in various international fora. The *Compendium* of existing measures contained a selection of multilateral and regional and interregional instruments that contained provisions related to transfer of technology and capacity building. When bilateral agreements were included, the number of instruments exceeded 80. Most important in this regard was the TRIPS Agreement. The strengthening of the regimes for intellectual property rights was assumed to engender positive impacts in developing countries, including more innovation and additional inward foreign direct investment and technology transfer. But there were also concerns that access to critical technologies might be limited in an overly protectionist intellectual property environment that did not properly balance incentive to innovate against the needs for dissemination of knowledge.

5. The provisions on transfer of technology and capacity building in international instruments were underpinned by a variety of shared concerns: effective integration of the developing countries in world trade and investment, protection of intellectual property rights and sustainable development. These provisions, including those on financing, had different objectives and scope and different modes of implementation, and they were subject to different terms and conditions. In most cases, however, such provisions took the form of "best effort" commitments, rather than mandatory rules.

6. These provisions generally distinguished between developed and developing countries, assigning differing obligations to different categories of addressees, so that technology could be transferred from countries with strong capabilities, i.e. developed countries, to countries with low capacities, i.e. developing countries, more particularly LDCs. This distinction was a common feature of multilateral agreements, such as the TRIPS Agreement. In some instruments, such as Agenda 21, the addressees included enterprises, while in other instruments, such as regional agreements among developing countries, there was no explicit distinction. Second, technology-related provisions could also be distinguished with respect to the type of technology they covered. Thus, the provisions of the Vienna

Convention for the Protection of the Ozone Layer related primarily to technologies for environmental protection. In contrast, the TRIPS Agreement referred to technology in a broader sense. Third, technology-related provisions could be distinguished with respect to the methods of implementation. Here a broad trend was evident: those instruments with a specific target (such as environmental protection) generally had an in-built mechanism of implementation, including financial provisions (such as the Montreal Protocol), while those instruments dealing with transfer of technology as a broad objective often relied on national measures in developed country addressees for their successful implementation (such as the TRIPS Agreement (article 66.2)). In addition, many technology-related provisions relied on national measures, particularly home country measures, for their implementation.

7. Finally, he noted that instruments differed in the terms and conditions under which transfer of technology was expected to occur. In some agreements, provisions call for "fair and reasonable terms", whereas other agreements emphasized the commercial nature of such transfer. Interestingly, there was no clear correlation between the implementation of particular provisions and their respective terms and conditions. The Montreal Protocol scored high on implementation and it also provided for technology transfer "on fair and most favourable conditions".

8. The session began with a panel discussion. The first panelist (Professor J. Reichman) pointed that in today=s increasingly liberal and competitive environment for technology transfer, the role of Governments was limited to reducing bargaining inequalities between the different actors of the technology-transfer process without creating distortions in the process of technology transfer or impediments to investment. As far as routine government actions were concerned, he distinguished between four possible elements: (1) the formulation of general guidelines establishing contractual conditions of the technology transfer process that should be fair and reasonable; (2) the formulation and implementation of competition laws and regulations against abusive claims in contracts and misuses of intellectual property rights (IPRs), both relating to traditional restrictive business practices and problems relating to the information economy; (3) the formulation of regional responses to IPRs; and (4) the Abargaining around TRIPS≅, i.e. the exploitation of elements in the Agreement (in particular paragraph 41.5 of the TRIPS Agreement (Ano better legal product than provided to nationals≅)) that provided for national bargaining power in a technology-transfer situation involving either compulsory licensing, parallel imports or reverse engineering by honest means. In closing, he pointed to five broad ideas that could stimulate the transfer of technology to developing countries: (1) the establishment in developing countries of interministerial coordinating committees on TRIPS, with a view to stimulating the national innovation system; (2) increased access to scientific and technical data and information through universities, research institutes, etc.; (3) the development of new modes of production, taking advantage of modern information technologies; (4) the emulation of best practices in university/private sector exchanges with a view to stimulating local innovation; and (5) the creation of three international voluntary funds: a worldwide fund structured along the lines of the United States National Science Foundation and the National Institute for

Health; a worldwide venture capital fund for technology development and supply; and a worldwide fund to assist in the production of essential medicines in generic form.

9. The second panelist (Professor H. Ullrich) pointed to the key role of anti-trust-law in the technology transfer process. He stressed that transfer of technology, since it was a market-driven process that only occurred if the demand (i.e. the willingness to pay a market-price and the subsequent ability to use the technology) existed, was dependent on the strict application and maintenance of market mechanisms. Anti-trust-law which was aimed at preserving workable markets (i.e. markets that were subject to workable competition obliging enterprises to meet the prices of rivals) could aid in this process through the creation of the right conditions for the transferor and the recipient that established a balance between the interests of all parties (in subcontracting, foreign direct investment, research and development cooperation and licensing), although this balance must be adjusted to the specific circumstances prevailing in individual cases. In this context, he pointed to the importance of the TRIPS Agreement's provisions on competition policy (in particular article 40 prohibiting abuses of licensing transactions and article 40.2 enabling countries to develop more elaborate rules in this regard) and the value of appropriate national and regional competition legislation. He also stressed that the technology transfer provisions analysed in the secretariat=s issues note related to specific circumstances, as indicated in the note, where a common good was at stake (such as the global ozone layer in the Montreal Protocol and the deep sea-bed in UNCLOS) and it was only to this extent that there was a politically and legally persuasive case for asking developed country addressees to give additional incentives for transfer of technology. He emphasized that technology transfer had been placed and assessed within its commercial context, rather than treated as an isolated licensing transaction. Finally, he pointed out that the main provisions in international law appeared to be Articles 8.2 and 40 of the TRIPS Agreement (on abusive licensing terms) forming a window of opportunity for elaborating a national technology transfer-related competition policy.

10. The third panelist (Professor C. Correa) stressed the importance of effective and balanced domestic IPR protection laws and the recipient country's absorptive capacity, both in terms of a technology market and the technological capacities of the receiving enterprises. With regard to the role of international agreements, he pointed out that so far recognition of the importance of technology transfer for developing countries was only formal in nature, expressed solely through the existence of the relevant international and regional arrangements, but that further refinement of those arrangements was needed in order to facilitate the practical possibilities of their actual implementation.

11. In the ensuing discussion, experts from the Dominican Republic, Egypt, Japan, Morocco, Sri Lanka, South Africa and Zambia, serving as lead discussants, presented papers, focusing on technology transfer measures undertaken by their respective Governments with regard to implementation of international arrangements. It was pointed out that some countries had benefited from transfer of technology through the application of such measures at the national and international level.

12. In the ensuing discussion, experts inquired about the various worldwide funds proposed by one of the discussants and discussed the definition of various arrangements in international instruments on transfer of technology, as well as its crucial importance in areas of common good (e.g. water supply, waste treatment, eco-labelling, health, nutrition, etc). The point was made that the international competitiveness of developing country products depended crucially on access to required technology, and that was made more difficult by the high cost of research, lack of funds, the brain drain and the resulting shortages in terms of appropriate human resources. International agreements, including those at the bilateral level, could however be of great help in this process. Recognizing that, in the knowledge-based global economy, technology played an increasingly important role in economic development, it was emphasized that any transfer of technology had to be accomplished within internationally-recognized parameters of protection for intellectual property, as established by the TRIPS Agreement.

13. With regard to the role of national coordinating committees, it was indicated that they should aim at (a) minimizing the social cost of the application of the TRIPS agreement; (b) maximizing the benefits that the TRIPS agreement entailed; and identifying comparative advantages at the enterprise level. In this context, the importance of access to scientific and technological information and databases and the threat posed by the ongoing privatization and commodification of such information on the one hand, and of stimulating local innovation without creating exclusive property rights on the other, was stressed. The importance of intellectual property right protection and the role of the private sector was also highlighted, especially since the Internet was revolutionizing access to technology. A strong business environment, including supportive chambers of commerce, would be key to successful transfer of technology. In this regard, the validity of the public-private sector exchange mechanism for developing countries was discussed, with attention being drawn to the problems related to a diversion of research activities from basic research to contract research and the unavailability of appropriate institutional infrastructures and absorptive capacity in developing countries.

14. The work of the technical assistance programmes of UNIDO and ESCAP/APCTT in this regard was highlighted. The UNFCCC programmes and the ongoing work of the Conference of the Parties were explained, as were the requirements of technology needs assessments in developing countries. The need for navigation tools to sort through the abundance of available information was stressed.

15. In the discussion on Article 66.2 of the TRIPS Agreement (obligation on developed Members to provide their enterprises and institutions with incentives for technology transfer to least developed country members), the point was made that developed country government policy could only directly influence the role of public institutions in capacity-building, whereas enterprise actions were beyond their scope. In this context, reference was made to various incentive schemes applied by developed countries. The Meeting was briefed by WTO representatives with regard to a recent seminar on technology and updated on the recent discussion in the WTO Council for TRIPS on matters related to Article 66.2.

Reference was also made to two papers issued by the WTO (WT/CTE/W/22 and IP/C/W/169). It was stressed that this matter required more attention and work with a view to facilitating transfer of technology in least developed countries.

16. In terms of national experiences, experts discussed a number of expert papers that highlighted the need to focus national policies on creating the required absorptive capacity at the institutional and enterprise level. Also emphasized in this regard was the crucial role of appropriate policies to attract and benefit from foreign direct investment, in particular export-oriented investment. Here, the importance of creating backward linkages between foreign affiliates of transnational corporations and the local economy was stressed. This could be supported through national efforts aimed at the Aindigenization≡ of the economy and downstream technology coordination.

Chapter III

ORGANIZATIONAL MATTERS

A. Convening of the Expert Meeting

17. The Expert Meeting on International Arrangements for Transfer of Technology was held at the Palais des Nations, Geneva, from 27 to 29 June 2001.

B. Election of officers

(Agenda item 1)

18. At its opening meeting, the Expert Meeting elected the following officers to serve on its bureau:

Chairperson:	Mr. Chak Mun See (Singapore)
Vice-Chairperson-cum-Rapporteur:	Mr. Francois Leger (France)

C. Adoption of the agenda

(Agenda item 2)

19. At the same meeting, the Expert Meeting adopted the provisional agenda circulated in document TD/B/COM.2/EM.9/1. The agenda for the Meeting was thus as follows:

1. Election of officers
2. Adoption of the agenda
3. International arrangements for transfer of technology
4. Adoption of the outcome of the Meeting

D. Documentation

20. For its consideration of the substantive agenda item, the Expert Meeting had before it the following documentation:

"International arrangements on transfer of technology: Best practices for access to and measures to encourage transfer of technology with a view to capacity-building in developing countries, especially in least developed countries – Issues note by the UNCTAD secretariat" (TD/B/COM.2/EM.9/2);

"Compendium of international arrangements on transfer of technology: selected instruments" (UNCTAD/ITE/IPC/Misc.5.

E. Adoption of the outcome of the Meeting

(Agenda item 4)

21. At its closing meeting, the Expert Meeting authorized the Rapporteur to prepare the final report of the Meeting, under the authority of the Chairperson.

Annex

ATTENDANCE *

1. Experts from the following States members of UNCTAD attended the Meeting:

Australia
Belgium
Brazil
Brunei Darussalam
Canada
Chad
China
Costa Rica
Dominican Republic
Egypt
Finland
France
Germany
Guinea
India
Indonesia
Italy
Japan
Madagascar
Morocco
Netherlands
Pakistan
Russian Federation
Saudi Arabia
Senegal
South Africa
Spain
Sri Lanka
Sweden
Thailand
Tunisia
United Kingdom of Great Britain and Northern Ireland
United States of America
Venezuela
Yemen
Zambia

2. The following intergovernmental organizations were represented at the Meeting:

Arab Labour Organization
European Community

3. The following specialized agencies and related organization were represented at the Meeting:

International Telecommunication Union
World Meteorological Organization
World Intellectual Property Organization
United Nations Industrial Development Organization
The World Trade Organization

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* For the list of participants, see TD/B/COM.2/EM.9/INF.1.

4. Economic and Social Commission for Asia and the Pacific
United Nations Framework Convention on Climate Change

5. The following non-governmental organizations were represented at the Meeting:

General Category

Engineers of the World
International Centre for Trade and Sustainable Development
International Chamber of Commerce
International Federation of Pharmaceutical Manufacturers Associations
Third World Network

6. The following Panellists attended the Meeting:

Mr. Hanns Ullrich, Professor, Institut für vergleichendes Wirtschaftsrecht, Technologierecht und Recht des Beschaffungswesens, München
Sr. Carlos Correa, Director de la Maestria en Politica y Gestion, Ciencia y la Technologial, Centro de Estudios Avanzados, Universidad de Buenos Aires
Mr. Jerome Reichman, Duke University School of Law, Durham